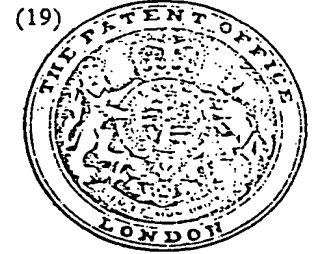


PATENT SPECIFICATION

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 (72) Inventor PETER HUGELMANN



(54) PLASTICS CAGE FOR ANGULAR CONTACT BALL BEARINGS

(71) We, WILHELM SCHAEFFLER and GEORG SCHAEFFLER, both German citizens, both of 8522 Herzogenaurach, Germany trading in partnership as Industriewerk Schaeffler OHG, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a plastics cage for angular contact ball bearings, in which the webs delimiting the pockets for receiving the balls are interconnected at both ends by cage end rings which are radially staggered in such a way that the cage can be produced by means of a simple, axially divisible injection mould.

Plastics cages of this kind which can be made in one piece in a comparatively simple, axially divisible injection mould are already known. However, for angular contact ball bearings, in particular, there is a demand for the development of a ball race and a cage as a self-supporting structural unit ready for installation, which it has not been possible to provide with the known plastics cages.

Another known plastics cage for tapered roller bearings is provided, on the side of greater diameter, with a lug which is directed towards the centre and engages in a recess in the inner bearing race. Admittedly, with this arrangement, the cage is held captive with respect to the inner bearing race, but the production of this cage requires complicated slider tools which involve comparatively high production costs.

The invention has for its object to overcome the disadvantages mentioned above and to provide a plastics cage for angular contact ball bearings which enables a self-supporting bearing unit to be produced in a simple and progressive way and with the aid of simple tools.

This is achieved according to the invention in that the outer circumferential surface of the radially smaller ring and/or the inner circumferential surface of the radially larger ring are/is provided with retaining lugs which are located in the areas of the pockets, the radial distance between the circumferential surfaces being equal to or greater than the radial height of each retaining lug. This arrangement has the advantage that the retaining lugs can be injection-moulded simultaneously with the production of the cage. The retaining lugs may be provided on all or only on some of the pockets. For angular contact ball bearings according to the invention, in particular, this enables the cage end rings to be designed in such a way that they can easily be made to suit the prevailing conditions of space.

According to a further development of the invention, each cage end ring has retaining lugs which are provided alternately in the circumferential direction on one and the other of the cage end rings. In this way the bearing is prevented by simple means from falling apart and a structural unit is provided which is self-supporting for transport as well as for installation.

Embodiments of the invention are illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a longitudinal section of a plastics cage fitted in an outer ball race;

Figure 2 is a side elevation of the above;

Figure 3 is a longitudinal section showing the connection of such a cage with the outer ball race and with a shaft; and

Figure 4 is a side elevation of the above.

The plastics cage for angular contact ball bearings shown in the drawings has radially inner and outer cage end rings 1 and 2 which are connected to one another by webs 3 delimiting pockets 4 for receiving balls 5. As shown in Figures 1 and 2, the cage end ring 1 has retaining lugs 6 which are located in the

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areas of the pockets 4 and extend circumferentially only over part of the width of the said pockets. The retaining lugs 6 engage in a recess 7 in an outer ball race 8 extending over the whole circumference so as to provide a connection between the cage and the outer ball race 8, which prevents the individual parts of the bearing from falling apart.

The height of the retaining lugs 6, which in the example illustrated corresponds to the radial distance between the opposite circumferential surfaces 9 and 10 of the cage end rings 1 and 2, can be selected without difficulty to suit the expected requirements.

Figures 3 and 4 show a construction of the cage in which the cage end ring 1 has retaining lugs 6 which are directed radially outwards and cooperate with the recess 7 in the outer ball race 8, which recess 7 extends over the entire circumference of the bearing. The retaining lugs 11 of the cage end ring 2 are directed radially inwards and engage in a circumferential groove 12 in a shaft 13. As can be seen from Figure 4, in particular, the retaining lugs 6 and 11 are provided, in the circumferential direction, alternately on one and on the other of the cage end rings 1 and 2.

WHAT WE CLAIM IS:—

1. A plastics cage for angular contact ball bearings, in which the webs delimiting the pockets for receiving the balls are connected at both ends by cage end rings which are radially staggered in such a way that the cage can be produced by means of an axially divisible injection mould, characterised in that the outer circumferential surface of the radially smaller ring and/or the inner circumferential surface of the radially larger ring are/is provided with retaining lugs which are located in the areas of the pockets, the radial distance between the circumferential surfaces being equal to or greater than the radial height of each retaining lug.

2. A plastics cage according to claim 1, characterised in that each cage end ring has retaining lugs which are provided alternately in the circumferential direction on one and the other of the cage end rings.

3. A plastics cage, substantially as described with reference to Figures 1 and 2 or Figures 3 and 4 of the accompanying drawings.

REDDIE AND GROSE
Agents for the Applicants,
6, Bream's Buildings,
London, EC4A 1HN

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COMPLETE SPECIFICATION

1 SHEET

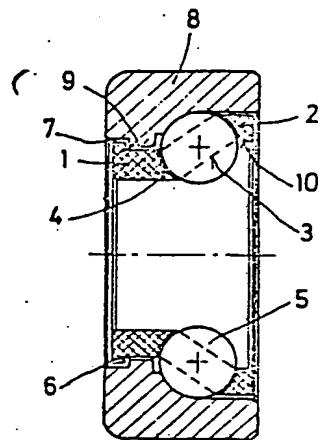
*This drawing is a reproduction of
the Original on a reduced scale*

Fig. 1

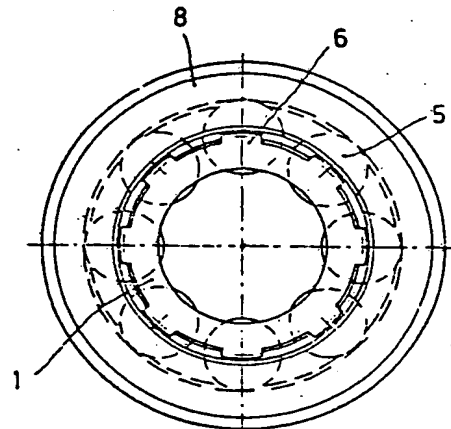


Fig. 2

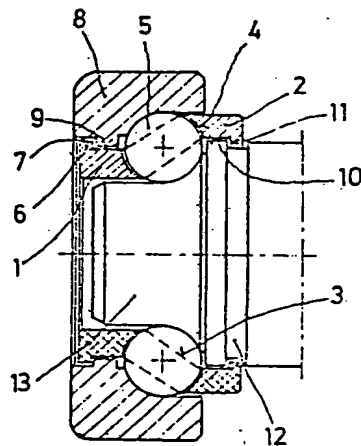


Fig. 3

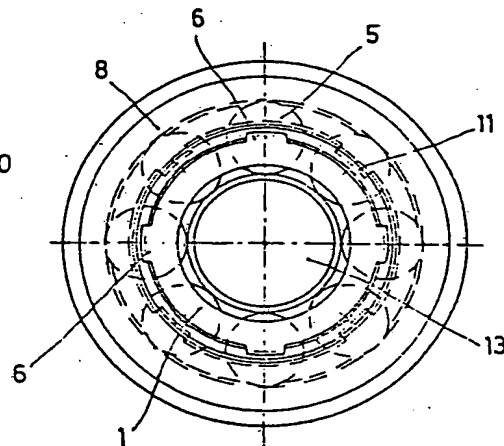


Fig. 4

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(6) Derwent-Image

Title Tapered roller bearing with cage containing pockets - has interlocking protuberances and grooves and ball race

Patent Data

Patent Family DE4338350 A1 19950511 DW1995-24 F16C-019/36 4p * AP: 1993DE-4338350 19931110
Priority n° 1993DE-4338350 19931110
Covered countries 1
Publications count 1

Abstract

Basic Abstract

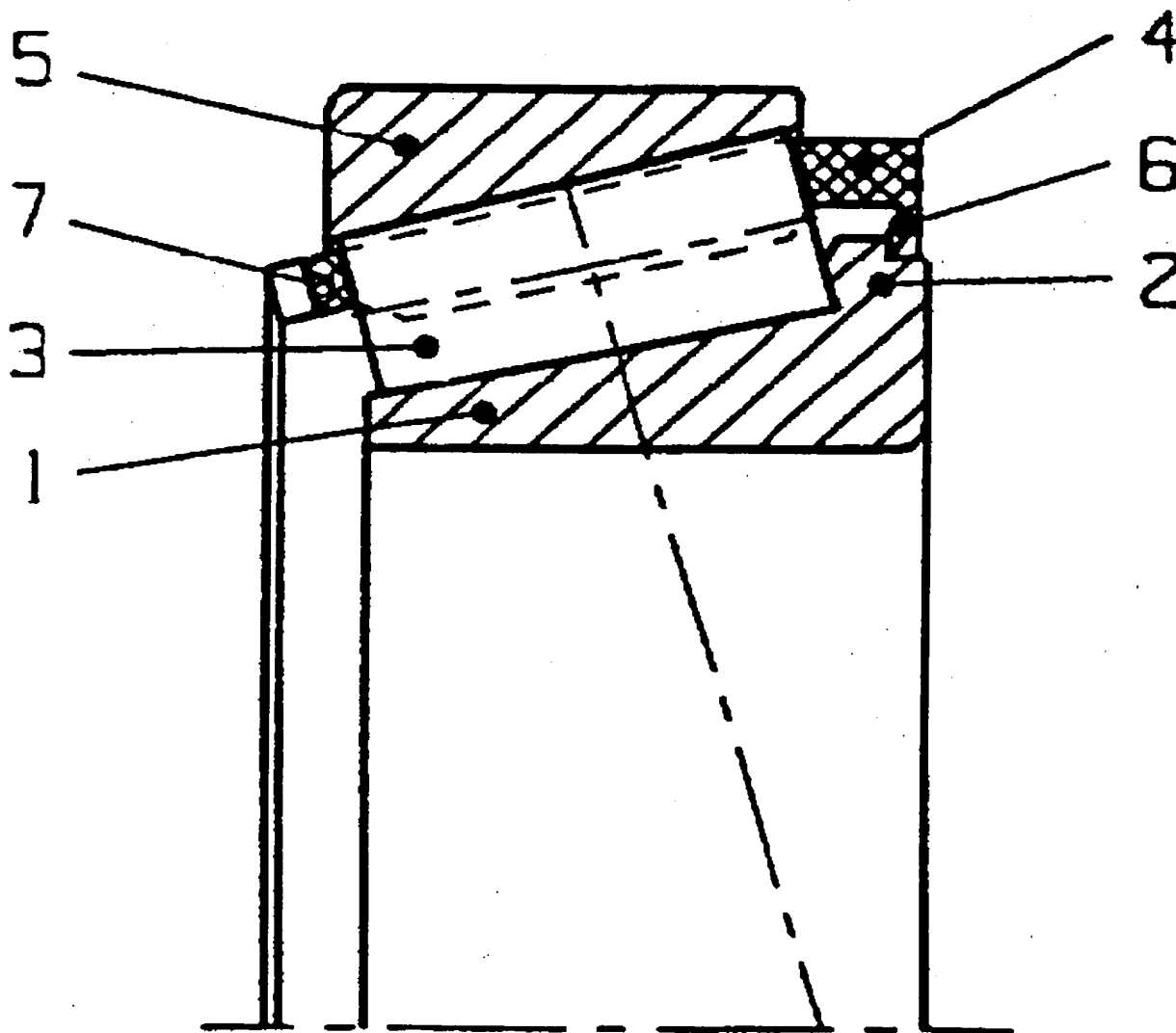
DE4338350 A The inner ring (1) has a rim (2) solely on the large diameter. The protuberances (6) are on the large cage. The groove or the protuberance are on the large inner ring diameter. Elastic pieces in the form of axial shafts (7) or segmented lips (8) are positioned on the small cage diameter.

During assembly, the inner ring with its rim over the cage protuberances is pressed against the force of the elastic axial shafts or segmented lips until the cage protuberances clip into the groove or behind the protuberance (2).

USE/ADVANTAGE - The tapered roller bearing is easily assembled, friction-free, compact and economically produced.

(Dwg.1/3)

Drawing



Patentee, Inventor

Patent assignee (KUGE) FAG KUGELFISCHER SCHAEFER KGAA
Inventor(s) HOFMANN H; WILM B

IPC

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